INTRODUCTION

The genus **Citrus** belongs to subfamily **Aurantiodeae** which is the most important subdivision in the family **Rutaceae**. This genus is divided into two distinct subgenera **Eucitrus** and **Papeda**. The subgenus **Eucitrus** includes all of the commercially cultivated species which have pulp-vesicles filled with flavorful juice and are free or almost free from oil droplets. On the contrary, all the species of **Papeda** are inedible with pup-vesicels containing droplets of acrid oil giving the juice a disagreable and bitter flavor. (Zielinski, 1955).

Swingle (1943) recognized sixteen species under genus **Citrus**, while Tanaka (1937, 1954) gave much wider classification of genus **Citrus**. He reported one hundred and fourty five species in this genus.

Citrus species are known to hybridize among themselves easily without much difficulty and numerous instances of naturally occurring hybrids have been reported (swingle , 1943). Many of these hybrids produce apparently normal seeds, that produce plants true to the type. This is due to nucellar embryony.

Citrus fruits rank third after grapes and apples, as far as world production is concerned. In Arab Republic of Egypt, Citrus trees are the backbone of fruit

culture. It occupies about 60% of the total fruit area. According to the 1987 census, the total area planted with citrus in A.R.E. was 265249 Feddans (After the Department of the economics and Statistics, Ministry of Agriculture, Giza, A.R.E).

During the past half century, fruit growers and pomologists, have from time to time, devoted much attention to the problem of fruit set of the commercial citrus varieties. In many instances, it was found that the unsatisfactory fruit set of these varieties had resulted from a lack of varieties suitable for cross-pollination. Therefore, the present investigation was undertaken to study the effect of cross-pollination and some growth regulators treatments on fruit set, fruit drop, yield , fruit quality and number of seeds per fruit in Washington navel orange, Jaffa orange, Mazizy orange, Clementine tangarine and Agami lime. Such studies may help in finding the reason for the shy bearing of some varieties in some regions of the A.R.E and to evaluate the significance of cross-pollination and some growth regulators in improving fruit setting and fruit quality of these varieties.

This investigation was aimed also to study the cytology of pollen formation and the histology of ovules fertilization and embryo growth among some citrus species and varieties to correlate these variations to fertility of each.